

## **What is the Gulf of Mexico Hypoxic Zone?**

Each spring and summer, the Gulf of Mexico experiences what is known as the “dead zone,” or hypoxic zone. It is believed that the Gulf Of Mexico hypoxic zone occurs when algae (phytoplankton) flourishes in the well-lit, nutrient-rich waters of the Gulf before drifting to the bottom after death. When the algae dies and drops to the bottom, it begins to decompose which depletes the oxygen for other organisms living near or on the bottom of the ocean floor.

The Gulf of Mexico hypoxic zone is located along the Louisiana-Texas-Mississippi coast. Fish can usually leave the area of the dead zone while bottom dwelling organisms that can't move out of the zone usually die. The hypoxic zone in the Gulf is thought to be caused primarily by excess nitrogen delivered from the Mississippi River along with seasonal stratification (layering) of Gulf waters. Nitrogen promotes algal and zooplankton growth (as zooplankton feed on the algae), but when the organisms die and decompose they sink to the denser bottom layers of Gulf waters and deplete the oxygen supply other aquatic life needs to live. In the summer months, the lower layer doesn't get 'mixed' with the higher levels of dissolved oxygen above and experiences very low levels or no measurable levels of dissolved oxygen.

Large hypoxic zones that occur at the mouths of rivers are not unusual, especially during high temperature seasons. They can be found in Long Island Sound, Chesapeake Bay, the Baltic Sea and the Black Sea. However, the Gulf hypoxic zone is among the largest, in some years covering an area comparable in size to the state of New Jersey.

The Gulf of Mexico is home to a wide variety of aquatic life and also provides millions of jobs opportunities. The Gulf is responsible for supplying trillions of dollars to the U.S. economy, according to the Gulf of Mexico Alliance. The Alliance is made up of governors from the five states that border the Gulf – Texas, Louisiana, Mississippi, Alabama and Florida. Recently, they unveiled an ambitious five-year action plan that aims to enhance the health of the Gulf by working to address the major challenges facing the Gulf.

While the Gulf states are active in the Alliance, there are many other states that help control of the Gulf's future.

A Time magazine article in 2008 said: “In 2006 U.S. farmers used more than 21 million tons of nitrogen, phosphorus and other fertilizers to boost their crops, and all those chemicals have consequences far beyond the immediate area. When the spring rains come, fertilizer from Midwestern farms drains into the Mississippi river system and down to Louisiana, where the agricultural sewage pours into the Gulf of Mexico. Just as fertilizer speeds the growth of plants on land, the chemicals enhance the rapid development of algae in the water. When the algae die and decompose, the process sucks all the oxygen out of the surrounding waters, leading to a hypoxic event — better known as a "dead zone." The water becomes as barren as the surface of the moon. What sea life that can flee the zone does so; what can't, dies.”

An article by the Mississippi State University Extension Service stated: “Water from two-thirds of the United States drains into the Gulf of Mexico, and one-half of the runoff from all this land actually makes its way into the Gulf. Excessive levels of nitrogen, phosphorus, and other nutrients come from city sewage treatment plants, industrial operations, septic tanks, lawns,

gardens, and agricultural activities. An overdose of nitrogen and phosphorus can lead to algal blooms that deplete the water's dissolved oxygen, making it unsuitable for other forms of life. A 3,600-square-mile oxygen-deficient "dead zone," located off the coasts of Texas and Louisiana, contributes to a dramatic reduction in species diversity and abundance in the region. This area is in the heart of one of the nation's richest and most extensive fishing grounds.”

To learn more about the Gulf of Mexico and the actions being taken to protect it, go to the following Web sites.

For information on the Gulf of Mexico Alliance:

<http://gulfofmexicoalliance.org/>

Information about the EPA's Gulf Guardian award is posted at:

[www.epa.gov/gmpo/gulfguard.html](http://www.epa.gov/gmpo/gulfguard.html)

An article about the Gulf Guardian Award

[http://www.ursbtr.com/LWEA/admin/docs/crock/CROCK\\_May09\\_WFINAL\\_2.pdf](http://www.ursbtr.com/LWEA/admin/docs/crock/CROCK_May09_WFINAL_2.pdf)

The Harte Research Institute

<http://www.gulfbase.org/>

Louisiana Universities Marine Consortium

<http://www.gulfhypoxia.net/>

U.S. Geological Survey

<http://toxics.usgs.gov/definitions/hypoxia.html>

EPA Gulf of Mexico Program

<http://www.epa.gov/gmpo/lmrsbc/index.html>